Course Description

Introduction to Computer Architecture

Course Specifications:

- Course Coordinator : A. Prof. Ahmed El-Bialy/ Dr. Sahar Fawzy
- Department offering the course : Systems and Biomedical Eng.
- Academic year / level : First year

Basic information

Title : Introduction to Computer Architecture
Code : **SBE 101**
Credit hours : Lecture: 4 hrs
Tutorial & Practical : 2 hrs
Total : 6 hrs

Professional Information

Fundamentals of Computers (Introduction) - Data Representation - Boolean Algebra and Logic Circuits - Registers and Counters - Computer Architecture (H/W) - Memory Definition - Addressing Memory Modes - Introduction to Computer Software - Operating Systems & System Software

By the end of the course the student should understand the main components of the computer and their functionality. The student should be able to design a complete central processing unit with a corresponding simple instruction-set, even more he can put a simple assembly program using all of his instruction set.

Contents

Period	Topic	Lecture (hours)	Tutorial Practical
Week 1	**Introduction**	4	2
Week 2	**Data Representation**	4	2
Week 3	**Number System**	4	2
Week 4	**Boolean Algebra and Logic Circuits**	4	2
Week 5	**Sequential Circuits**	4	2
Week 6	**Registers and Counters**	4	2
Week 7	**Mid Exam**	4	2
Week 8	**Register Transfer and Micro Operations**	4	2
Week 9	**Basic Computer Instruction Set**	4	2
Week 10	**Decoder and Instruction Set**	4	2
Week 11	**Instruction Set and Concept of Interrupt**	4	2

Week 12	**Control Unit Design**	4	2
Week 13	**Software and Operating Systems**	4	2
Week 14	**Pre-Final Exam**	4	2
Week 15	**Project Presentations**	4	2
Week 16	**Final Exam**	4	2

Teaching and Learning Methods

Lecture, class, lab, discussions and Project.

Student Assessment Methods

***The Assignments**: Teaching the student how to solve problems, how to design and teaching him the way of thinking.*

***Reports**: simple design problems to help the students to understand specific concepts of the course.*

***Class Test**: to keep the student on the track.*

***Mid-exams**: to evaluate the students' way of thinking and material understanding.*

***Project**: to practically apply the main concepts of the course.*

***Final exam**: a total student evaluation.*

Assessment Schedule

The Assignments: weekly
Reports: Monthly
Class Test: Frequently.
Mid-exams: week 7 and week 14
Project: week 15.
Final exam: final week.

7- Weighting of Assessment s

The Assignments, Reports and Class Test: 5%
Mid-exams: 10%.
Project: 15%.
Final exam: 70%

8- Text Book:

- Computer System Architecture by Morris Mano, 3rd ed.,Prentice Hall 1992
- Digital Computer Fundamentals by Thomas Bartee, 6th ed, McGraw-Hill, New York.

9- List of References

- Computer Systems Concepts and Design by Glenn A. Gibson Prentice – Hall International Editions.
- Microprocessors / Micro computers Architecture, Software and system by ADI J. Khambata John Wiley & sons